Edd Clark & Associates, Inc.
Environmental Consultants

February 16, 2006
Job No.: 0351,001.99

Steve Hart
1952 Siesta Lane
Santa Rosa, California 95403

Workplan
Groundwater Interim Remediation
1952 Siesta Lane
Santa Rosa, California
NCRWQCB Case No. 1TSR360

Dear Mr. Hart:

Please accept this as Edd Clark & Associates, Inc.'s (EC&A's) workplan for interim remediation in the vicinity of the former underground storage tank (UST) for home heating oil at 1952 Siesta Lane (site), Santa Rosa, California (Figure 1). Because concentrations of total petroleum hydrocarbons as diesel (TPHd) continue to fluctuate over time without an obvious declining trend, the North Coast Regional Water Quality Control Board (NCRWQCB), in their letter dated April 27, 2005, requested a workplan for interim remediation. To remove groundwater with high TPHd concentrations and thereby attempt to eliminate the ongoing fluctuations in TPHd concentrations and move the site toward closure, EC&A proposes to conduct a high vacuum dual phase extraction (HVDPE) event at the site. A copy of this workplan will be submitted to the NCRWQCB for their review and approval and the Santa Rosa Fire Department (SRFD) for their review.

PROPOSED SCOPE OF WORK

HVDPE, also known as multi-phase extraction or vacuum-enhanced extraction, is the recommended method for removal of fuel hydrocarbon- (FHC-) impacted groundwater at the site. Work proposed for interim remediation includes the following activities:

- Obtaining an encroachment permit from the City of Santa Rosa Public Works Department (SRPWD);
- Conducting a 14-day HVDPE pilot-test on existing monitoring wells MW-3 and MW-4 to evaluate the effectiveness of this remediation method;
- Extending the HVDPE event to 30 days if this remediation method proves to be effective;
- Acquiring appropriate permits from the City of Santa Rosa Utilities Department Sub Regional Water Reclamation System (SRUDSRWRS) for disposal of treated groundwater to the municipal sewer system;
- Storing and disposing of treated water under permit to the City of Santa Rosa sewer system;
- Collecting vapor and effluent water samples during operation of the HVDPE system;

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- Collecting groundwater samples from all existing monitoring wells for chemical analysis after extraction of groundwater and vapors; and
- Preparing a summary report describing the work completed and presenting conclusions and recommendations regarding site conditions.

BACKGROUND

Site Description

The site is a residence located at 1952 Siesta Lane in Santa Rosa, California. The nearest cross street is La Paloma Avenue. The former UST was located between the sidewalk bordering La Paloma Avenue and the residence. An out-of-service water-supply well is located about 60 feet (ft) southeast of the former UST (Figure 2).

The ground surface in the location of the former UST is relatively flat. The apparent groundwater-flow direction is toward the west. Santa Rosa Creek, which flows toward the west, is approximately 600 ft south of the site (Figure 1).

July 1999 UST Removal

On July 12, 1999, the Fuel Oil Polishing Company (FOPCO) of Cotati, California, removed one 200-gallon UST for home heating oil from the site under a permit issued by the SRFD. The dimensions of the UST excavation are shown on Figures 2 and 3. Approximately one cubic yard (cu yd) of soil was excavated to remove the UST and, with the approval of the SRFD, placed back into the excavation. Clean soil was added to grade.

Soil samples collected from the UST excavation and excavated soil were analyzed for TPHd and benzene, toluene, ethylbenzene and xylenes (BTEX). TPHd, toluene, ethylbenzene and xylenes were detected in the samples. UST removal sample results are presented in Table 1.

May 2000 Preliminary Site Investigation

On May 10, 2000, EC&A directed the advancement of soil borings B-1 through B-4 (Figure 2). Soil and grab-groundwater samples collected from B-1 through B-4 were analyzed for TPHd and BTEX. The grab-groundwater sample collected from B-1 was also analyzed for methyl tert-butyl ether (MTBE) and the other gasoline oxygenates.

Concentrations of TPHd were detected in two soil samples and xylenes were detected in one soil sample. Concentrations of TPHd were detected in two groundwater samples. A sheen was observed on the samples collected from B-1 and B-3. Table 2 presents the soil sample analytical results from the soil borings. Table 3 presents the grab-groundwater sample analytical results.

February 2001 Sensitive Receptor Survey

EC&A conducted a sensitive receptor survey (SRS) in the vicinity of the site in February 2001. Water wells were identified within a 1000-ft radius of the site by a door-to-door survey and a

Department of Water Resources (DWR) records search. Three wells were identified within 300 ft of the former UST: one onsite about 60 ft southeast of the former UST, one at 1945 Rodgers Way (AP #181-21-2), about 150 ft south of the former UST, and one at 2007 Rodgers Way (AP #181-22-33), about 230 ft northeast of the former UST. The onsite well is not in service; the other two wells are used only for irrigation. The three wells were sampled for TPHd and BTEX on February 22 and 23, 2001; no analytes were detected. Results from the February 2001 SRS are described in detail in EC&A's April 4, 2001 SRS report.

October 2001 Additional Groundwater Investigation

The purpose of the October 2001 additional groundwater investigation was to further assess groundwater quality and to evaluate groundwater-flow direction and gradient in the vicinity of the former UST. On October 22 and 23, 2001, EC&A directed the installation of three 2-inch-diameter groundwater monitoring wells (MW-1, MW-2 and MW-3, Figure 2).

All soil samples collected from the monitoring wells were analyzed for TPHd and BTEX. Soil samples from MW-1 and MW-2 were also analyzed for TPHg. TPHd in two of the six soil samples was the only analyte detected in soil samples collected from the well borings. Table 2 presents the soil sample analytical results.

November 2001 Extended Sensitive Receptor Survey

In November 2001, EC&A conducted a door-to-door survey within a 1000-ft radius of the former UST location in order to locate water-supply wells in the vicinity of the site that had been missed in the previous survey.

Private Water-supply Wells

During the door-to-door survey, EC&A located twenty-five properties within the survey radius that have or may have private water-supply wells. Eight wells were identified within 300 ft of the former UST. The onsite well was not in service; the other seven wells appeared to be used only for irrigation. Based on the door-to-door survey results, it appeared that the residences and businesses in the vicinity of the subject site are connected to city water. However, some properties still have active water-supply wells that are used for landscaping purposes only.

May 2002 Offsite Irrigation Well Sampling

EC&A personnel collected groundwater samples from offsite irrigation wells WW-5 (2002 Siesta Lane) and WW-6 (2014 Siesta Lane) on May 29, 2002, and from WW-4 (1955 Rogers Way) on September 24, 2002. All samples were analyzed for TPHd and BTEX. TPHd and BTEX were not detected in any of the samples. Analytical results for groundwater samples from irrigation wells are summarized on Table 4.

October 2002 Over-excavation

On October 2, 2002, EC&A personnel directed the removal and disposal of FHC-impacted soil from the location of the former UST. Approximately six in-place cu yds of apparently clean soil (overburden) were removed from the uppermost 2 ft of the excavation and temporarily stockpiled

onsite for later use as top soil over the excavated area. Following the removal of the overburden, approximately 90 in-place cu yds of FHC-contaminated soil were over-excavated and transported to Keller Canyon Landfill for disposal. The excavation was backfilled on October 2, 2002.

TPHd was detected in all over-excavation sidewall samples at concentrations ranging from 7.0 milligrams per kilogram (mg/kg) to 15,000 mg/kg. Minor concentrations of ethylbenzene and/or xylenes were detected in four of the sidewall samples. 2-Methylnaphthalene was detected in a sidewall sample at 22 mg/kg. TPHd was detected in the soil stockpile sample at 10 mg/kg. Analytical results for soil samples from the over-excavation and temporary overburden stockpile are presented on Table 5. The locations of the soil samples are shown on Figure 3.

October 2002 Additional Soil and Groundwater Investigation
EC&A personnel directed the advancement of exploratory soil boring B-7 and the installation of two-inch-diameter groundwater monitoring well MW-4 on October 11, 2002, and exploratory soil borings B-5 and B-6 on October 15, 2002. Boring and well locations are presented on Figure 2.

Soil and grab-groundwater samples collected from the borings were analyzed for TPHd and BTEX. TPHd and BTEX were not detected in any of the soil and grab-groundwater samples. Soil boring soil sample analytical results are presented in Table 2. Soil boring grab-groundwater samples analytical results are presented in Table 3.

Quarterly Groundwater Monitoring - November 2001 through October 2005
From November 2001 through October 2005, MW-1 has been sampled seven times, MW-2 fourteen times, MW-3 sixteen times and MW-4 twelve times. Groundwater samples collected from the site monitoring wells were analyzed for TPHd and BTEX by EPA Methods 8015m/8020.

In MW-1, which is located approximately 55 ft northwest and down/cross-gradient from the former UST (Figure 4), TPHd has not been detected since sampling began in November 2001. Minor concentrations of xylenes were detected in MW-1 in two of seven monitoring events conducted to date (June 2003 and April 2005).

Prior to the October 2005 event in MW-2, which is located approximately 65 ft west and down-gradient from the former UST, TPHd had not been detected since June 2003. In October 2005, TPHd was detected at 110 micrograms per liter (µg/l) in MW-2, making it the first detection in the past seven consecutive events for which MW-2 was sampled. Minor concentration of BTEX compounds have only been detected in MW-2 for the past two events for which it was sampled (April and October 2005). Previous to April 2005, BTEX was non-detect (ND) for twelve consecutive events.

TPHd concentrations in MW-3 continue to fluctuate between sampling events. MW-3 is located approximately 15 ft southeast and cross-gradient from the former location of the UST. Since the October 2002 over-excavation, concentrations of TPHd in MW-3 have ranged from 94 µg/l in June 2004 to 25,000 µg/l in December 2002. Between the July and October 2005 sample events, TPHd concentrations decreased from 730 µg/l to 330 µg/l. BTEX compounds have only been detected

three times in MW-3 (November 2001, April and October 2005). For the October 2005 event, benzene and toluene were detected for the first time in MW-3, and ethylbenzene and xylenes for the second time, all at minor concentrations.

TPHd concentrations in MW-4 have ranged from 91 µg/l in July 2005 to 1400 µg/l in December 2003. Between the July and October 2005 sample events, the TPHd concentration increased from 91 µg/l to 280 µg/l. MW-4 is located approximately 10 ft northwest and down/cross-gradient from the former location of the UST. For the October 2005 event, benzene and toluene were detected for the first time in MW-4 (8.7 µg/l and 13 µg/l, respectively), and ethylbenzene and xylenes were detected at the highest concentrations to date (4.6 µg/l and 18 µg/l, respectively).

Analytical results for groundwater samples from monitoring wells are summarized on Table 6. Figure 5 is a time-series graph showing TPHd concentrations in MW-3 and MW-4 and depth to groundwater in MW-3.

Onsite Water Well

Groundwater samples were collected from onsite out-of-service water-supply well WW-1 five times from December 2002 to December 2003. Samples were analyzed for TPHd and BTEX. These analytes have never been detected in WW-1. Analytical results for WW-1 are presented in Table 4.

HYDROGEOLOGY

In the sixteen groundwater monitoring events conducted to date, the top of groundwater has ranged from 11.49 ft to 17.33 ft bgs (Table 7) and the groundwater-flow direction has ranged from S04°E to N62°W. The groundwater-flow direction has been west-northwest to west-southwest fifteen out of sixteen times (Figure 4). For the December 2002 monitoring event, the groundwater-flow direction was southerly.

Site soils have been sampled in eleven soil/well borings. Over most of the site, vadose-zone soils consist largely of clayey to sandy silt. In B-3, B-5, B-6, B-7, MW-3 and MW-4, the lower part of the vadose-zone is sandy to gravelly. The top of the gravelly unit is highest under the eastern part of the site in borings B-5, B-6 and B-7.

Saturated-zone samples in B-1, B-2 and MW-1 consisted of aquitard materials, mostly sandy clay with silt, clayey silt, and sandy silt. Thin sand and/or gravel layers may be present in these borings in the unsampled intervals, particularly in B-1, which had 750,000 µg/l TPHd in the grab-groundwater sample.

The saturated zone in MW-2 and MW-3 is a sandy gravel to gravelly sand from about 14 ft to about 19 ft below ground surface (bgs). In MW-4, clayey gravel was present from 14.5 ft bgs to about 17 ft bgs. In B-3 and B-4, silty sandy gravel was present from about 15 ft bgs to total depth (18 ft). A gravelly unit was present in borings B-5, B-6 and B-7 below 8 ft to 9 ft bgs.

DISCUSSION

Extent of FHC-impacted Soil and Groundwater

Soil

Soil with significant concentrations of TPHd remains in the north, east and south walls of the October 2002 excavation (Figure 3). The extent of TPHd-impacted soil is constrained by ND concentrations to the northeast in B-2, to the east by B-7, to the south by B-5 and B-6, and to the west by B-4. Figure 2 shows the maximum TPHd concentrations in soil for site soil borings.

Groundwater

Based on the analytical data to date, the north-eastern limit of the plume of TPHd-impacted groundwater is near B-2, which is about 15 ft north of the former UST. ND results from MW-1, about 55 ft northwest of the former UST, constrains the northwest limit of the TPHd-impacted groundwater plume. The southeast to south limit of the plume is between MW-3, which is approximately 12 ft southeast of the former UST, and borings B-5, B-6 and B-7, which are 20 to 40 ft south to southeast of the former UST. TPHd-impacted groundwater has migrated approximately 65 ft west (down-gradient) of the former UST to MW-2, which has had sporadic detections of TPHd (110 µg/l in October 2005). The sandy gravel unit present under most of the site apparently provides a pathway for the movement of TPHd-impacted groundwater. Figure 2 shows TPHd and benzene concentrations in the soil borings on the date they were drilled and in the monitoring wells on October 6, 2005.

There is a tenuous relationship between the fluctuations of groundwater elevations and TPHd concentrations in MW-3 and MW-4 (Figure 5). There have been four wet-season peaks in TPHd concentrations in MW-3 since monitoring began in November 2001. In the 2001/2002 and 2003/2004 wet seasons, the highest TPHd concentrations were measured in the monitoring event preceding the highest groundwater elevation (November 2001 and December 2003). In the 2002/2003 and 2004/2005 wet seasons, the highest TPHd concentrations coincided with the highest groundwater elevation (December 2002 and January 2005). However, significant rises in TPHd concentrations in MW-3 took place in September 2002 and October 2004 while groundwater levels were still low. A similar relationship is observed in MW-4, where the fall samples in 2002, 2003 and 2004 showed increased concentrations of TPHd at the same time that groundwater levels were still declining.

Overall, there has been a gradual decline in the maximum and minimum TPHd concentrations in MW-3 and MW-4 since the October 2002 over-excavation (Figure 5). However, because TPHd concentrations are declining slowly, it appears that the time frame for natural degradation to reduce FHC concentrations to levels compliant with NCRWQCB Water Quality Objectives (WQOs) would be great, requiring extended groundwater monitoring. Interim remediation consisting of groundwater extraction and disposal would significantly reduce the time frame to achieve the NCRWQCB WQOs.

SOIL AND GROUNDWATER REMEDIATION WORKPLAN

High-vacuum dual-phase extraction (HVDPE), also known as multi-phase extraction or vacuum-enhanced extraction, is the recommended interim remediation method to remove of FHC-impacted groundwater at the site. The removal of groundwater with elevated TPHd concentrations should reduce TPHd concentrations and move the site toward closure. Site work will be performed as described in the tasks listed below.

Task 1 - Project Management, Permit Acquisition and Agency Notification
EC&A will prepare and submit an encroachment permit application to the SRPWD to allow parking an HVDPE truck against the curb and running hoses from the truck across the sidewalk to the onsite work area. A permit will also be obtained from the SRUDSRWRS for disposal of treated groundwater to the municipal sewer system. The NCRWQCB and SRFD will be notified at least 48 hours prior to field work.

Task 2 - High-Vacuum Dual Phase Extraction
A 14-day to 30-day HVDPE event will be conducted by CalClean, Inc., of Tustin, California using a truck-mounted, low-noise unit equipped with a 450-cubic-feet-per-minute (CFM) HVDPE system. Extracted groundwater and vapors will be treated in a propane-fired thermal oxidizer. Extracted groundwater will also be polished by passing it through carbon canisters prior to its discharge into the sanitary sewer system under a permit issued by the SRUDSRWRS. Any free product extracted by the system will be vacuumed off the water-holding tank prior to polishing through the carbon canisters. The product will be pumped into 55-gallon drums for disposal at an appropriate disposal facility.

Periodically during the HVDPE event, CalClean will record system parameters such as vacuum, temperature, vapor flow rate and the amount of groundwater extracted from the site. Groundwater drawdown/vacuum response in monitoring wells MW-1 through MW-4 will periodically be measured. An Horiba MEXA-324JU field analyzer, calibrated as hexane, will be used for field measurements of influent hydrocarbon concentrations.

Vapor samples will be collected in Tedlar bags and submitted to a state-certified laboratory under chain of custody procedures for analyses for BTEX (Method SW8021B). Vapor samples will only be analyzed for BTEX because diesel is semi-volatile and, therefore, not amenable to vapor analysis. One combined (composite) vapor sample will be collected at startup, at five-day intervals during operation of the system, and at shutdown. Up to five combined influent vapor samples will be obtained during the 14-day event.

Monitoring wells MW-3 and MW-4 will be used to extract groundwater. The greatest TPHd concentrations have been detected in these wells and they are closest to the location of the former UST. Initially, 1-inch- or 1¼-inch-internal-diameter (ID) stinger tubes will be lowered to the level of groundwater in MW-3 and MW-4. As groundwater is extracted, the stinger tubes will be lowered gradually until they reach the bottom of each well. This will be done to dewater the saturated zone

around the wells used for extraction. By keeping the stinger below the water table, the wells should be dewatered for the duration of the project. This will increase the cone of depression around the wells and increase the area from which vapors can be extracted and maximize groundwater extraction.

During the HVDPE event, the system may be shutdown periodically to allow groundwater to recharge and possibly flush diesel adsorbed onto soil into groundwater so that it can be extracted. After 14 days, the effectiveness of the HVDPE remediation will be evaluated. Depending on the evaluation, the HVDPE event may be terminated or shutdown for about two weeks to provide an opportunity for TPHd concentrations in groundwater to rebound, and then restarted for another 14-day event.

Groundwater Disposal

Groundwater extracted during HVDPE will be separated out in the extraction system. Up to 300 gallons per day of extracted water may be beneficially reused as make-up water for the HVDPE system. The remaining water will be treated through an onsite treatment process. Most of the hydrocarbon contaminants will be removed from the extracted water by use of air sparging and heating while under high vacuum in the inlet tank. The process-treated water will then be transferred to a storage tank where any free product will be vacuumed off into 55-gallon drums for disposal at an appropriate disposal facility.

The water will then be polished through carbon canisters and pumped into a temporary storage tank where it will be characterized per SRUDSRWRS discharge requirements. Assuming the effluent meets the discharge requirements, it will be discharged into the sewer system. Following the initial characterization, with the approval of the SRUDSRWRS, the effluent will then be discharged directly into sewer system after it is polished. A water meter will be placed in line to measure the amount of water being discharged, and a sample port will be installed for periodic sampling in accordance with the requirements of the discharge permit.

Based on previous experience with HVDPE events at other sites, EC&A anticipates that approximately 2500 gallons of groundwater will be extracted per day, or approximately 35,000 gallons per 14-day event.

Task 3 - Evaluation of Groundwater Conditions

After the completion of a 14-day HVDPE event and recharge of the wells to water levels similar to the pre-HVDPE levels, groundwater samples will be collected from MW-3 and MW-4 and analyzed for TPHd and BTEX. Based on the analytical results, another 14-day HVDPE event may be conducted. If a second 14-day HVDPE event is conducted, groundwater samples will be collected from MW-3 and MW-4 at the conclusion of the event, after groundwater levels have stabilized. Groundwater samples will also be collected from MW-1 and MW-2 if the second event is conducted during seasonally high water-table levels. Sampling procedures will be in accordance with those performed at the site during quarterly sampling events.

Task 4 - Report Preparation
Following conclusion of the HVDPE event and receipt of all analytical data, EC&A will prepare a written report documenting site procedures, proving field data collected during the event, and presenting conclusions and recommendations regarding site conditions.

SITE SAFETY PLAN

The attached Site Safety Plan (Appendix A) identifies the chemicals and other potential safety hazards that may be encountered during the investigation, describes precautionary measures to be taken when in the presence of these chemicals and other potential safety hazards, and contains a map to the nearest medical facility.

SCHEDULE

EC&A anticipates that site work will be initiated within one month after the NCRWQCB reviews this workplan and issues a letter of approval, and the required permits are obtained.

LIMITATIONS

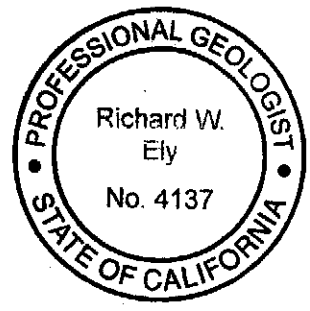
The conclusions presented in this document are professional opinions based on the information presented herein, which includes data generated by others. Whereas EC&A does not guarantee the accuracy of data supplied by third parties, we reserve the right to use this data in formulating our professional opinions. This document is intended only for the indicated purpose and project site. Conclusions and recommendations presented herein apply to site conditions existing at the time of our study. Changes in the conditions of the site property can occur with time because of natural processes or the works of man on the site or adjacent properties. In addition, changes in applicable standards can also occur as the result of legislation or from the broadening of knowledge. Accordingly, the findings of this document may be invalidated, wholly or in part, by changes beyond our control.

Thank you for allowing EC&A the opportunity to provide environmental services for you. Please call if you have any questions.

Very truly yours,

John Calomiris
Technical Operations Manager

Richard Ely, PG #4137
Senior Geologist

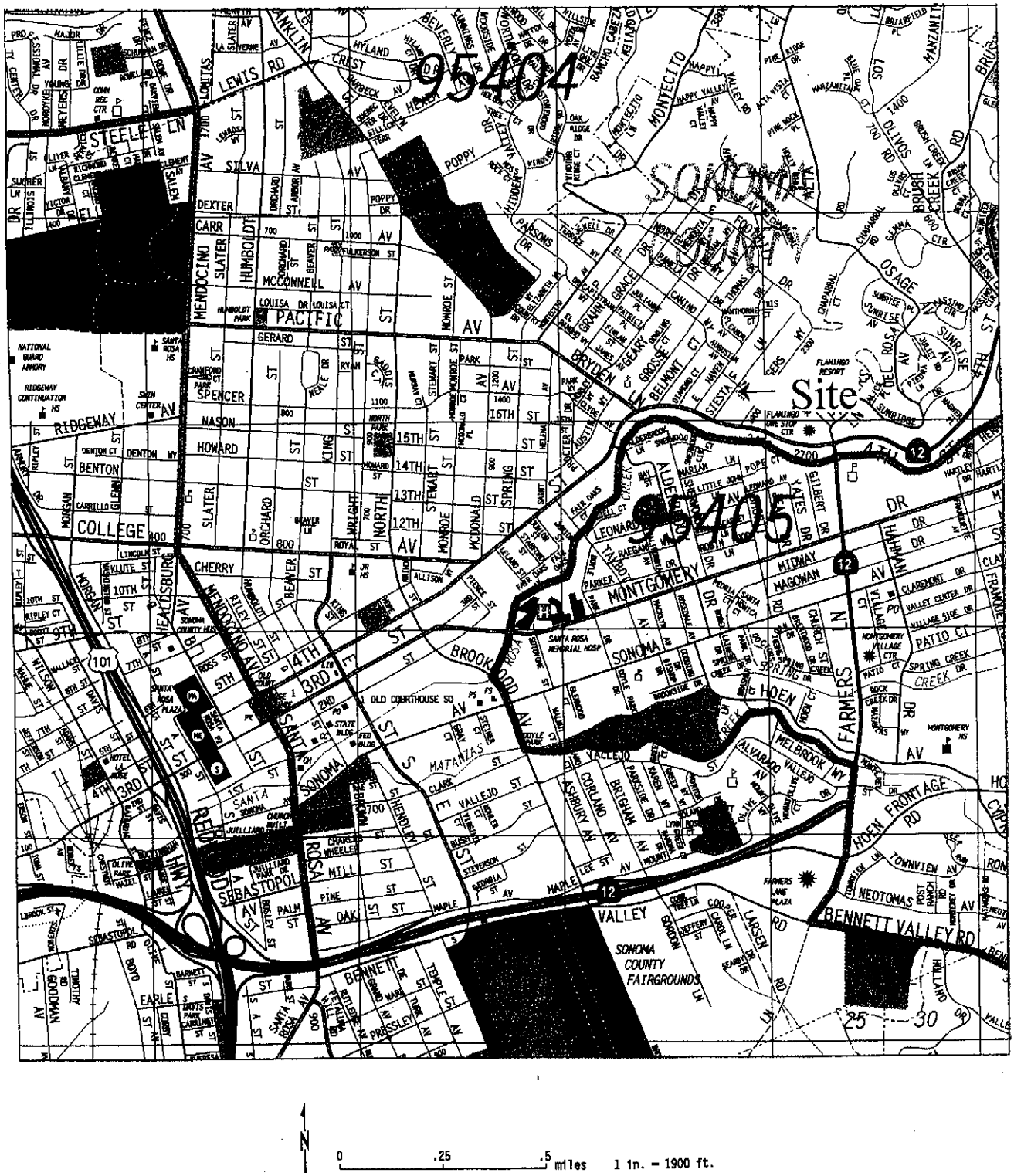


Attachments: Figure 1 - Site Location Map
Figure 2 - Site Map with FHC Concentrations
Figure 3 - Over-excavation Soil Sample Map
Figure 4 - Groundwater Elevation Map with TPHd Concentrations, 06 October 2005
Figure 5 - Concentrations of TPHd Versus Time in Monitoring Wells MW-3 and MW-4
Table 1 - Analytical Results - Soil Samples from UST Removal
Table 2 - Analytical Results - Soil Samples from Borings
Table 3 - Analytical Results - Grab-groundwater Samples from Borings
Table 4 - Analytical Results - Groundwater Samples from Water Wells
Table 5 - Analytical Results - Soil Samples from Over-excavation
Table 6 - Analytical Results - Groundwater Samples from Monitoring Wells
Table 7 - Groundwater Elevation Data

Appendix A - Site Safety Plan

cc: Joan Fleck, North Coast Regional Water Quality Control Board
Corey Vincent, Santa Rosa Fire Department

0351\HVDPE workplan



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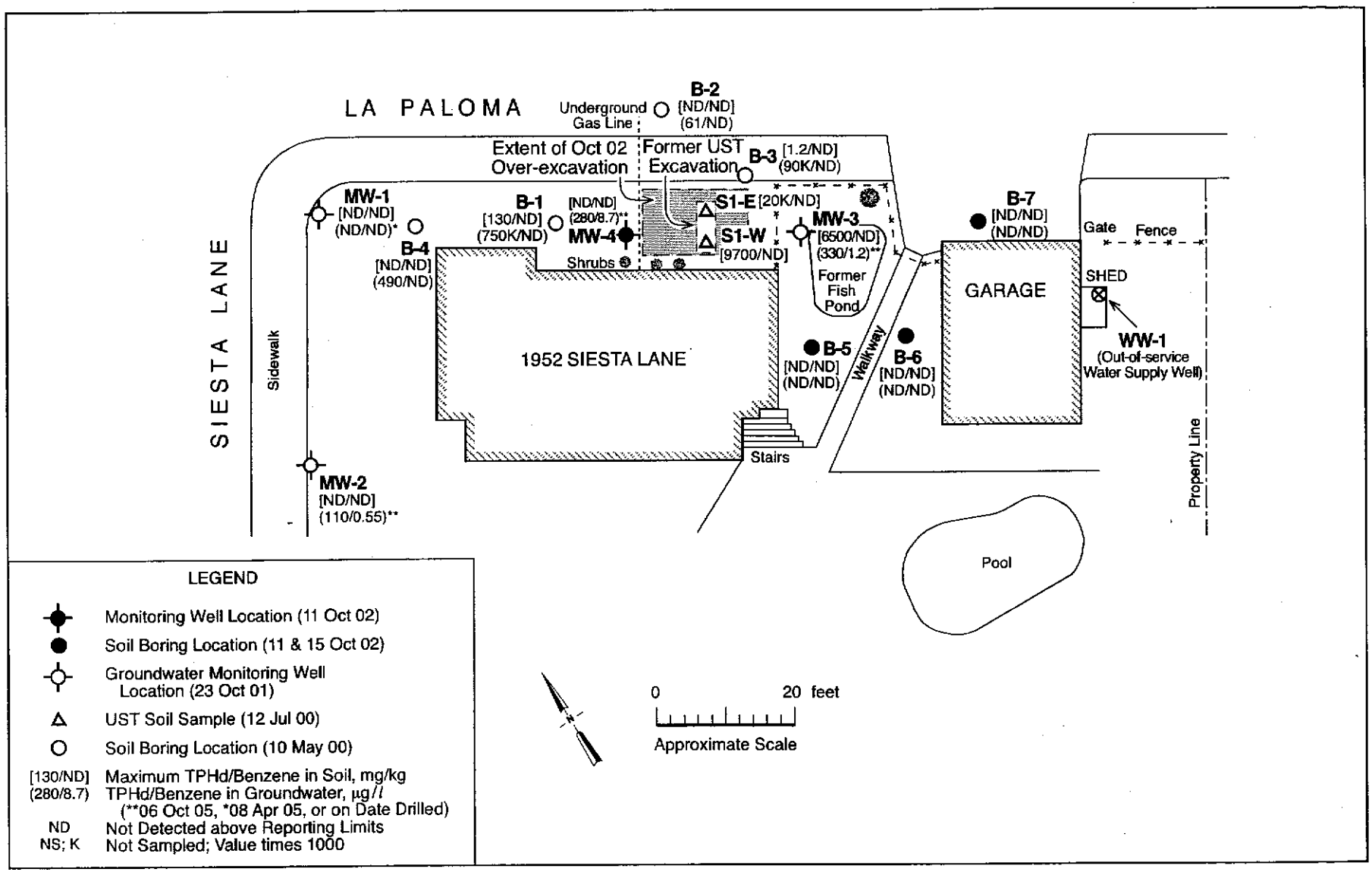
Site Location Map
1952 Siesta Lane
Santa Rosa, California

FIGURE
1

JOB NUMBER	REVIEWED BY:	DATE:	REVISED DATE:
0351,001.99	Lori Brown	January 2003	



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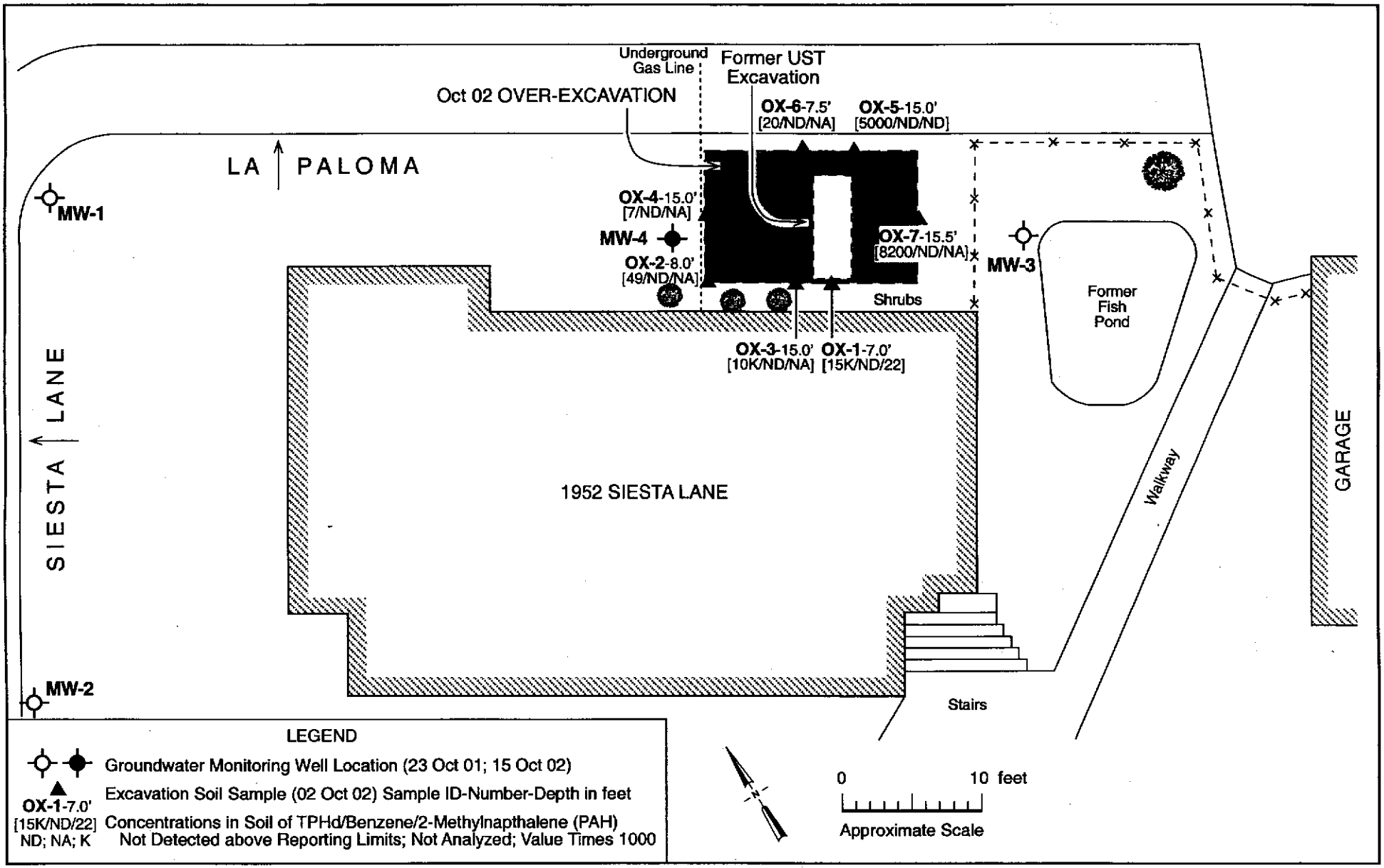
SITE MAP
with FHC Concentrations
1952 Siesta Lane
Santa Rosa, California

FIGURE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
0351, 001.99	EC&A, Richard Ely	November 1999	February 2006

(TRACE #350/RG/16Feb06)



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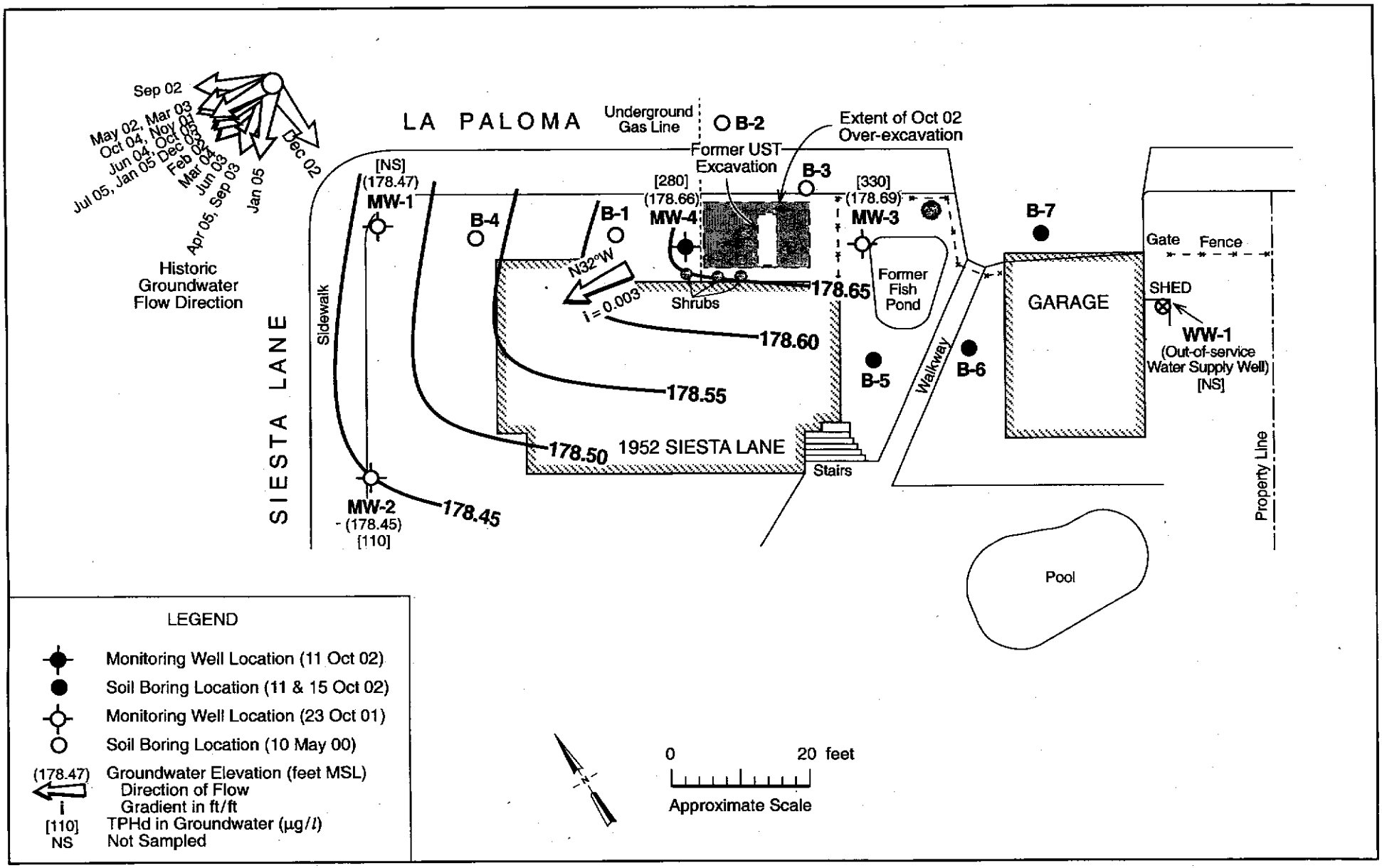
OVER-EXCAVATION SOIL SAMPLE MAP

1952 Siesta Lane
Santa Rosa, California

FIGURE
3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
0351, 001.99	EC&A, Jeff Monroe	November 1999	June 2005

(TRACE #350/RG/11Jun05)



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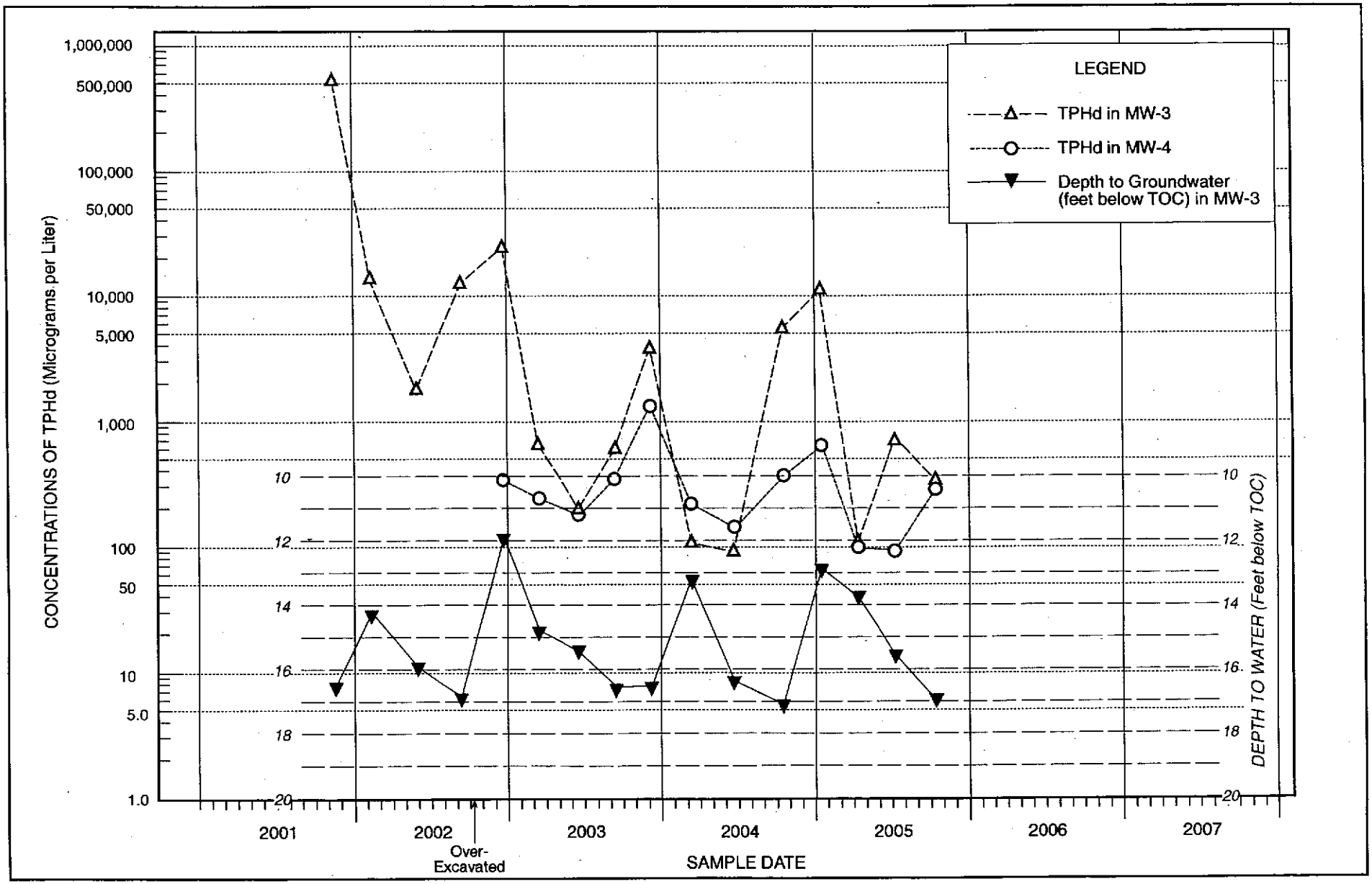
GROUNDWATER ELEVATION MAP
with TPHd Concentrations, 06 October 2005

1952 Siesta Lane
Santa Rosa, California

FIGURE
4

JOB NUMBER	0351, 001.99	REVIEWED BY	EC&A, E.J. VandenBosch	DATE	March 2005	REVISED DATE	December 2005

(TRACE #350/RG/30Dec05)



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CONCENTRATIONS OF TPHd VERSUS TIME
in Monitoring Wells MW-3 and MW-4

1952 Siesta Lane
Santa Rosa, California

FIGURE
5

JOB NUMBER	REVIEWED BY	DATE	REVISED	SHEET NO.
0351.001.99	EC&A, E.J. VandenBosch	March 2005	December 2005	1 of 1

(TRACE #350/RG/21Aug05)

Table 1. Analytical Results - Soil Samples from UST Removal
1952 Siesta Lane, Santa Rosa, California

Sample ID	Date	Sample Depth ft bgs	TPHd mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl-benzene mg/kg	Xylenes mg/kg
S-1E	07/12/99	6	20,000 [a/e]	ND<0.40	4.5	5.5	37
S-1W	07/12/99	6	9700 [a/e]	ND<0.10	1.9	2.4	18
SS-1 (Stockpile)	07/12/99	----	13,000 [a/e]	ND<0.30	2.7	3.0	22

TPHd: Total petroleum hydrocarbons as diesel
ft bgs: Feet below ground surface
mg/kg: Milligrams per kilogram
ND: Not detected above the respective reporting limit
a: Unmodified or weakly modified diesel is significant
e: Medium boiling point pattern that does not match diesel (fuel oil?)

Table 2. Analytical Results - Soil Samples from Borings
1952 Siesta Lane, Santa Rosa, California

Sample ID-Depth ft bgs	Date	TPHd mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl-benzene mg/kg	Xylenes mg/kg
B-1-10.5	05/10/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-1-16.0	05/10/00	130 [a]	ND<0.005	ND<0.005	ND<0.005	0.038
B-2-10.5	05/10/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-2-16.0	05/10/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-3-5.5	05/10/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-3-10.5	05/10/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-3-15.5	05/10/00	1.2 [b]	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-4-10.5	05/10/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-4-15.5	05/10/00	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-5-11.0	10/15/02	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-5-16.0	10/15/02	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-6-11.0	10/15/02	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-6-16.0	10/15/02	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-7-11.0	10/11/02	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
B-7-15.5	10/11/02	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
MW-1-11.0*	10/23/01	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
MW-1-16.0*	10/23/01	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
MW-2-11.0*	10/23/01	5.2 [d,e]	ND<0.005	ND<0.005	ND<0.005	ND<0.005
MW-2-16.0*	10/23/01	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
MW-3-11.0	10/22/01	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
MW-3-16.0	10/22/01	6500 [a]	ND<0.020	ND<0.02	ND<0.040	ND<0.04
MW-4-11.0	10/11/02	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
MW-4-15.5	10/11/02	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005

Notes

TPHd:	Total petroleum hydrocarbons as diesel
ft bgs:	Feet below ground surface
mg/kg:	Milligrams per kilogram
ND:	Not detected above the respective reporting limit
a:	Unmodified or weakly modified diesel is significant
b:	Diesel range compounds are significant; no recognizable pattern
d:	Gasoline range compounds are significant
e:	Medium boiling point pattern that does not match diesel (unidentified pattern)
*:	Samples MW-1 and MW-2 were also analyzed for total petroleum hydrocarbons as gasoline (TPHg); all results were ND

Table 3. Analytical Results - Grab-groundwater Samples from Borings
1952 Siesta Lane, Santa Rosa, California

Sample ID	Sample Depth ft bgs	Date	TPHd µg/l	Benzene µg/l	Toluene µg/l	Ethyl-benzene µg/l	Xylenes µg/l
B-1 *	15.0	05/10/00	750,000 [a,h]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
B-2	15.0	05/10/00	61 [g,i]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
B-3	16.0	05/10/00	90,000 [a,d,h,i]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
B-4	15.5	05/10/00	490 [a,i]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
B-5W	18.0	10/15/02	ND<50 [l]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
B-6W	19.5	10/15/02	ND<50 [l]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
B-7W	17.5	10/11/02	ND<50 [l]	ND<0.5	ND<0.5	ND<0.5	ND<0.5

TPHd: Total petroleum hydrocarbons as diesel
ft bgs: Feet below ground surface
µg/l: Micrograms per liter
ND: Not detected above the respective reporting limit
*: Sample B-1 was also analyzed for MTBE and the other gasoline oxygenates by EPA Method 8260; results were all ND
a: Unmodified or weakly modified diesel is significant
g: Oil range compounds are significant
h: Lighter than water immiscible sheen is present
i: Liquid sample that contains greater than ~5 vol. % sediment
l: Liquid sample that contains greater than ~2 vol. % sediment

Table 4. Analytical Results - Groundwater Samples from Water Wells
1952 Siesta Lane, Santa Rosa, California

Sample ID	Date	TPHd µg/l	Benzene µg/l	Toluene µg/l	Ethyl-benzene µg/l	Xylenes µg/l
WW-5	05/29/02	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
WW-6	05/29/02	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
WW-4	09/24/02	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
WW-1	12/23/02	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
WW-1	03/12/03	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
WW-1	06/16/03	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
WW-1	09/10/03	ND<50*	ND<0.5	ND<0.5	ND<0.5	ND<0.5
WW-1	12/03/03	ND<50*	ND<0.5	ND<0.5	ND<0.5	ND<0.5

WW-1 is an onsite, out-of-service water well
WW-4 is an 8-inch out-of-service irrigation well located at 1955 Rogers Way
WW-5 is a 6-inch irrigation well located at 2002 Siesta Lane
WW-6 is a 6-inch irrigation well located at 2014 Siesta Lane

TPHd: Total petroleum hydrocarbons as diesel
µg/l: Micrograms per liter
ND: Not detected above the reporting limit
*: TPHd analyzed using silica gel cleanup

0351\table 4 WWs

Table 5. Analytical Results - Soil Samples from Over-excavation
1952 Siesta Lane, Santa Rosa, California

Sample ID	Date	Sample Depth ft bgs	TPHd mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl-benzene mg/kg	Xylenes mg/kg
OX-1	10/02/02	7.0	15,000 [a]	ND<1	ND<1	3.7	29
OX-2	10/02/02	8.0	49 [f]	ND<0.005	ND<0.005	ND<0.005	ND<0.005
OX-3	10/02/02	15.0	10,000 [a]	ND<0.5	ND<0.5	1.2	6.0
OX-4	10/02/02	15.0	7.0 [f]	ND<0.005	ND<0.005	ND<0.005	ND<0.005
OX-5	10/02/02	15.0	5000 [a]	ND<0.1	ND<0.1	1.6	5.3
OX-6	10/02/02	7.5	20 [f]	ND<0.005	ND<0.005	ND<0.005	ND<0.005
OX-7	10/02/02	15.5	8200 [a]	ND<0.5	ND<0.5	ND<0.5	1.4
SP-1(a-b) (Stockpile)	10/02/02	----	10 [c]	ND<0.005	ND<0.005	ND<0.005	ND<0.005

TPHd: Total petroleum hydrocarbons as diesel
ft bgs: Feet below ground surface
mg/kg: Milligrams per kilogram
ND: Not detected above the respective reporting limit
a: Unmodified or weakly modified diesel is significant
c: Aged diesel? is significant
f: One to a few isolated peaks present

Note: In addition to the analytical results presented above, soil samples OX-1 and OX-5 were analyzed for polynuclear aromatic hydrocarbons (PAHs/PNAs) by EPA Method 8270; 2-Methylnaphthalene at 22 mg/kg was detected in OX-1; no other PAHs/PNAs were detected above the respective reporting limits.

Table 6. Analytical Results - Groundwater Samples from Monitoring Wells
1952 Siesta Lane, Santa Rosa, California

Sample ID	Date	DTW ft bgs	TPHd µg/l	Benzene µg/l	Toluene µg/l	Ethyl-benzene µg/l	Xylenes µg/l
MW-1 †	11/14/01	16.66	ND<50 [i]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	02/11/02	14.36	ND<50 [i]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	05/29/02	16.03	ND<50 [i]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	09/09/02	17.03	ND<50 [i]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	06/16/03	15.51	ND<50	ND<0.5	ND<0.5	ND<0.5	1.6
	03/08/04	13.23	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	04/08/05	13.55	ND<50	ND<0.5	ND<0.5	ND<0.5	0.56
	10/06/05	16.94	NS	NS	NS	NS	NS
MW-2 †	11/14/01	16.29	90 [b,i]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	02/11/02	14.02	ND<50 [i]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	05/29/02	15.66	60 [b]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	09/09/02	16.64	ND<50 [i]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	12/23/02	11.49	240 [a]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	03/12/03	14.59	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	06/16/03	15.15	58 [b]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	09/10/03	16.42	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	12/03/03	16.31	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	03/08/04	12.90	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	06/21/04	16.13	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	10/15/04	16.89	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	04/08/05	13.21	ND<50	ND<0.5	ND<0.5	0.75	1.6
	10/06/05	16.56	110 [b,g]	0.55	0.83	ND<0.5	1.3
MW-3	11/14/01	16.78	540,000 [a,h,i]	ND<0.5	ND<0.5	0.56	2.2
	02/11/02	14.52	15,000 [a,h,i]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	05/29/02	16.14	1800 [a]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	09/09/02	17.10	13,000 [a,i]	ND<0.5	ND<0.5	ND<0.5	ND<0.5

Table 6. Analytical Results - Groundwater Samples from Monitoring Wells
1952 Siesta Lane, Santa Rosa, California

Sample ID	Date	DTW ft bgs	TPHd µg/l	Benzene µg/l	Toluene µg/l	Ethyl-benzene µg/l	Xylenes µg/l
MW-3 continued	12/23/02	12.18	25,000 [a]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	03/12/03	15.05	650 [a]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	06/16/03	15.61	200 [c]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	09/10/03	16.87	600 [c]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	12/03/03	16.78	3900 [c]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	03/08/04	13.43	110 [a]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	06/21/04	16.58	94 [a]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	10/15/04	17.33	5500 [a,h]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	01/14/05	13.16	11,000 [a,h,i]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	04/08/05	13.77	110 [b]	ND<0.5	ND<0.5	0.90	2.0
	07/01/05	15.62	730 [c,g]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	10/06/05	16.99	330 [c,g]	1.2	1.6	0.64	2.2
MW-4	12/23/02	12.01	330 [a]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	03/12/03	14.91	240 [a]	ND<0.5	ND<0.5	1.1	2.0
	06/16/03	15.49	190 [a]	ND<0.5	ND<0.5	0.60	1.6
	09/10/03	16.75	330 [a]	ND<0.5	ND<0.5	ND<0.5	0.93
	12/03/03	16.65	1400 [a]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	03/08/04	13.30	210 [a]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	06/21/04	16.47	150 [a]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	10/15/04	17.23	370 [a]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	01/14/05	13.01	640 [a,i]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	04/08/05	13.83	100 [b]	ND<0.5	ND<0.5	1.0	2.4
	07/01/05	15.49	91 [b]	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	10/06/05	16.87	280 [d,b,g]	8.7	13	4.6	18

Notes
DTW: Depth to water below top of casing
ft bgs: Feet below ground surface
TPHd: Total petroleum hydrocarbons as diesel
µg/l: Micrograms per liter
ND: Not detected above the reporting limit
NS: Not sampled

Notes, continued

a: Unmodified or weakly modified diesel is significant
b: Diesel range compounds are significant; no recognizable pattern
c: Aged diesel? is significant
d: Gasoline range compounds are significant
g: Oil range compounds are significant
h: Lighter than water immiscible sheen is present
i: Liquid sample that contains greater than ~1 or ~2 vol. % sediment
†: MW-1 is sampled annually during seasonally high water; MW-2 is sampled semiannually during seasonally high and low water-table levels

Table 7. Groundwater Elevation Data
1952 Siesta Lane, Santa Rosa, California

Well ID	Date	TOC Elevation feet	DTW feet	Groundwater Elevation feet
MW-1	11/14/01	195.41	16.66	178.75
MW-2		195.01	16.29	178.72
MW-3		195.68	16.78	178.90
Gradient: S78°W, 0.023 ft/ft				
MW-1	02/11/02	195.41	14.36	181.05
MW-2		195.01	14.02	180.99
MW-3		195.68	14.52	181.16
Gradient: S80°W, 0.0022 ft/ft				
MW-1	05/29/02	195.41	16.03	179.38
MW-2		195.01	15.66	179.35
MW-3		195.68	16.14	179.54
Gradient: N77°W, 0.0024 ft/ft				
MW-1	09/09/02	195.41	17.03	178.38
MW-2		195.01	16.64	178.37
MW-3		195.68	17.10	178.58
Gradient: N62°W, 0.0028 ft/ft				
MW-1	12/23/02	195.41	11.82	183.59
MW-2		195.01	11.49	183.52
MW-3		195.68	12.18	183.50
MW-4		195.53	12.01	183.52
Gradient: S04°E, ? *				
MW-1	03/12/03	195.41	14.94	180.47
MW-2		195.01	14.59	180.42
MW-3		195.68	15.05	180.63
MW-4		195.53	14.91	180.62
Gradient: N77°W, 0.0036 ft/ft **				

Table 7. Groundwater Elevation Data
1952 Siesta Lane, Santa Rosa, California

Well ID	Date	TOC Elevation feet	DTW feet	Groundwater Elevation feet
MW-1	06/16/03	195.41	15.51	179.90
MW-2		195.01	15.15	179.86
MW-3		195.68	15.61	180.07
MW-4		195.53	15.49	180.04
Gradient: S77°W, 0.0032 ft/ft				
MW-1	9/10/03	195.41	16.81	178.60
MW-2		195.01	16.42	178.59
MW-3		195.68	16.87	178.81
MW-4		195.53	16.75	178.78
Gradient: S57°W, 0.0045 ft/ft				
MW-1	12/03/03	195.41	16.69	178.72
MW-2		195.01	16.31	178.70
MW-3		195.68	16.78	178.90
MW-4		195.53	16.65	178.88
Gradient: S86°W, 0.0032 ft/ft				
MW-1	03/08/04	195.41	13.23	182.18
MW-2		195.01	12.90	182.11
MW-3		195.68	13.43	182.25
MW-4		195.53	13.30	182.23
Gradient: S71°W, 0.002 ft/ft				
MW-1	06/21/04	195.41	16.51	178.90
MW-2		195.01	16.13	178.88
MW-3		195.68	16.58	179.10
MW-4		195.53	16.47	179.06
Gradient: N90°W, 0.003 ft/ft				

Table 7. Groundwater Elevation Data
1952 Siesta Lane, Santa Rosa, California

Well ID	Date	TOC Elevation feet	DTW feet	Groundwater Elevation feet
MW-1	10/15/04	195.41	17.29	178.12
MW-2		195.01	16.89	178.12
MW-3		195.68	17.33	178.35
MW-4		195.53	17.23	178.30
Gradient: N80°W, 0.003 ft/ft				
MW-1	01/14/05	195.41	12.91	182.50
MW-2		195.01	12.56	182.45
MW-3		195.68	13.16	182.52
MW-4		195.53	13.01	182.52
Gradient: S42°W, 0.002 ft/ft				
MW-1	04/08/05	195.41	13.55	181.86
MW-2		195.01	13.21	181.80
MW-3		195.68	13.77	181.91
MW-4		195.53	13.83	181.70
Gradient: S58°W, 0.002 ft/ft				
MW-1	07/01/05	195.41	15.51	179.90
MW-2		195.01	15.15	179.86
MW-3		195.68	15.62	180.06
MW-4		195.53	15.49	180.04
Gradient: S88°W, 0.003 ft/ft				
MW-1	10/06/05	195.41	16.94	178.47
MW-2		195.01	16.56	178.45
MW-3		195.68	16.99	178.69
MW-4		195.53	16.87	178.66
Gradient: N32°W, 0.003 ft/ft				

Notes

TOC: Top of casing elevation measured relative to mean sea level (msl)
DTW: Depth to water from TOC
NM: Not measured
*: The gradient was too flat over the area of measurement for a meaningful calculation of the gradient
**: The gradient was previously mis-recorded as S77°W, 0.0036 ft/ft in this table and on the Groundwater Elevation Map (GEM) for March 2003; the gradient for March 2003 as indicated above and by the contours on the March 2003 GEM was N77°W, 0.0036 ft/ft.

0351\table 6 GWE

Appendix A

Site Safety Plan

A. GENERAL INFORMATION

Site Location: 1952 Siesta Lane, Santa Rosa, California

Plan Prepared By: Richard W. Ely Date: February 15, 2006
Richard W. Ely, PG

Objective(s): Extract groundwater with elevated TPHd concentrations and free product if present.

Background Review: Complete: X Preliminary:

Documentation/Summary: Overall Hazard: Serious: Moderate: Low: X
Unknown:

Unusual Features (power lines, terrain, utilities, etc.): over-head power lines, residence.

STATUS: Active: X Inactive: Unknown:

HISTORY: (Agency Action, Complaints, Injuries, etc.) A 200-gallon UST for home heating oil was removed from the site in July 1999. Because concentrations of FHC-impacted groundwater continue to fluctuate over time without an obvious declining trend, the NCRWQCB interim remediation of FHCs at the site

B. SITE WASTE CHARACTERISTICS

Waste Type(s): Liquid: X(water) Solid: X(soil) Sludge: Gas:

Characteristic(s): Corrosive: Ignitable: Radioactive: Volatile: X
Toxic: X Reactive: Unknown Other (name): Flammable

Facility Description: single family home in residential neighborhood

Principle Disposal Method (type and location): Groundwater extracted during HVDPE will be separated out in the extraction system. Water not used as make-up water will be treated through an onsite treatment process. Most of the hydrocarbon contaminants will be removed from the extracted water by use of air sparging and heating while under high vacuum in the Inlet Tank. The process-treated water will then be transferred to a secondary treatment system, which consists of at least two carbon canisters in series. The treated water will then be pumped into the sewer system under permit from the SRUDSRWRS. If product is extracted it will be contained in 55-gallon drums and disposed of at an appropriate disposal facility.

C. HAZARD EVALUATION

Chemical Name	Description	Threshold Limit Values (TLVs)		Persons Exposed and Potential Routes of Exposure	Symptoms of Acute Exposure	TLV Basis
		8-hr TLV	Short-term Exposure Limit (STEL)			
Benzene	Carcinogen, aromatic HC	0.5 ppm	2.5 ppm	Inhalation, dermal	Headache, dizziness	Cancer
Toluene	Aromatic HC	50 ppm	—	Inhalation, dermal	Headache, dizziness	Central nervous system (CNS), irritation
Ethylbenzene	Aromatic HC	100 ppm	125 ppm	Inhalation, dermal	Headache, dizziness	Irritation, CNS
Xylenes	Aromatic HC	100 ppm	150 ppm	Inhalation, dermal	Headache, dizziness	Irritation
Diesel Fuel	Flammable liquid	pending	—	Inhalation, dermal	Headache, dizziness, eye/skin irritation	---

D. SITE SAFETY WORKPLAN

Perimeter Establishment: Map/Sketch Attached: X Site Secured: X
Perimeter Identified: X Zone(s) of Contamination Identified: X

Personal Protection:
Level of Protection: A: B: C: D: X

Modifications: Upgrade to level C upon high OVA readings (5 ppm)

Surveillance Equipment and Materials:
Instrument OVA Action Level 5 ppm

SITE PROCEDURES: Conduct a 14 to 30 day HVDPE event using MW-3 and MW-4, collect groundwater samples from selected monitoring wells during and after the HVDPE event.

HAZARDS: Potential hazards onsite comprise proximity to drilling equipment, exposure to explosive and flammable petroleum vapors and carcinogens.

LEVEL OF PROTECTION: Equipment to protect the body from contact with chemical hazards has been categorized by the Environmental Protection Agency into levels A, B, C, & D. Level A equipment is used when the highest level of protection is needed; Level D equipment is used when minimum protection is needed. The chemical hazard associated with petroleum hydrocarbons is typically low and Level D protection (see equipment list below) is

adequate. In case of high levels of contamination, an upgrade to Level C protection equipment may be advised. Level C and D equipment are listed below.

Level C Equipment: NIOSH/MSHA approved air purifying respirator, chemical resistant clothing, chemical resistant inner and outer gloves, chemical resistant boots with steel toe and shank, safety glasses and hard hat.

Level D Equipment: Coveralls, gloves, chemical resistant boots or shoes with steel toe and shank, safety glasses or chemical splash goggles, and hard hat. Tyvex overalls and Solvex or equivalent gloves are recommended.

EQUIPMENT REQUIRED FOR THIS PROJECT: Normal work clothing and safety glasses may be worn for site drilling work. Chemical-resistant gloves are required when sampling. Upgrade to Level C includes addition of NIOSH/MSHA approved air purifying respirator with organic vapor cartridges.

A First Aid Kit, fire extinguisher, and combustible gas indicator or PID are also required. The combustible gas indicator or PID is to be used to monitor air in breathing zone. Readings above 5 ppm are cause for concern. Continuous reading of 5 ppm or greater above background in the breathing zone requires an upgrade to Level C, including use of half-face respirator. Continuous readings of 50 ppm or greater in the breathing zone requires stopping the work.

The combustible gas indicator or PID is to be used continuously during all drilling activities. If more than 10 percent of the lower explosive limit (LEL) is measured in the drilling area proceed with caution. If more than 50 percent LEL is measured in the drilling area, provide ventilation of the area.

DECONTAMINATION PROCEDURES:

Personal: Remove gloves, wash hands; clean boots in decontamination area.
Equipment: Steam cleaning of all drilling equipment in the decontamination area. TSP wash of sampler between samples.

FIRST AID: Consultants vehicle has a first aid kit.

WORK LIMITATIONS (time of day, weather, heat/cold, stress): None

INVESTIGATION-DERIVED MATERIAL DISPOSAL: Water not used as make-up water will be treated through an onsite treatment process and discharged into the sewer system under permit from the SRSRSSS.

E. EMERGENCY INFORMATION

LOCAL RESOURCES:

Ambulance: 911

Hospital Emergency Room: Santa Rosa Memorial Hospital
1165 Montgomery Drive
Santa Rosa, California
707-546-3210

Directions to Hospital: Proceed west on fourth street. Turn left on Talbot. Turn right on Montgomery Drive. Hospital is on the north side of Montgomery Drive just after Sotoyome Drive.

Poison Control Center: (800) 233-3360 (415) 821-8324
Police: 911
Fire Department: 911
Explosives Unit: 911
Agency Contact: Joan Fleck, NCRWQCB (707) 576-2675

SITE RESOURCES:

Water Supply: Onsite
Telephone: Onsite
Radio: None
Other:

EMERGENCY CONTACT:

Name: Mr. Hart, Home Owner
Phone: (707) 528-0390

SITE SKETCH: (Work zones, command post, etc.): See Workplan

Signature Date

EDD CLARK & ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

Hospital Map
Santa Rosa Memorial Hospital
1165 Montgomery Drive
Santa Rosa, California

PLATE
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JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
0351,001.99		10/99	SEPTEMBER 2002	